SUPPLEMENT.

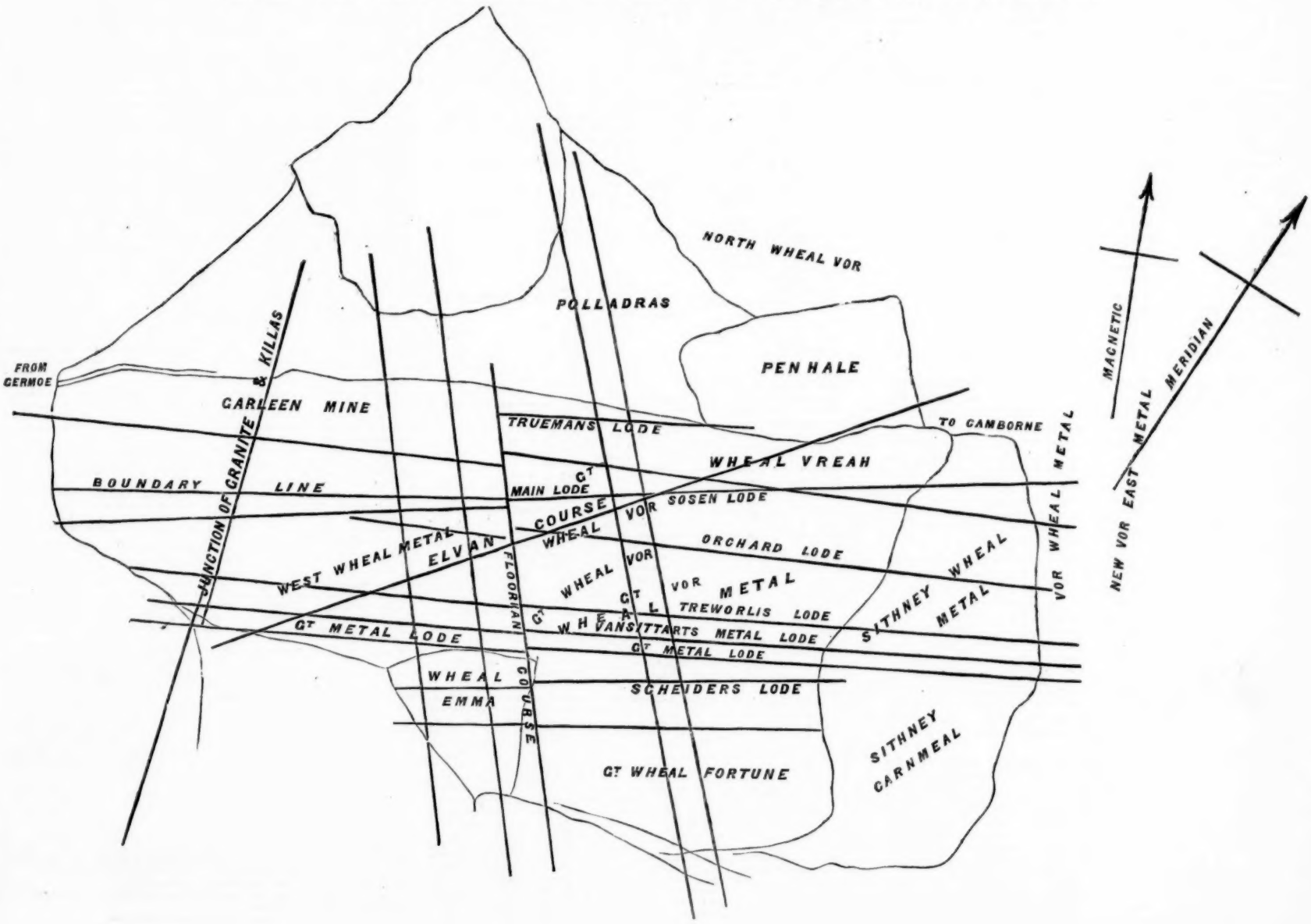
The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1492.—Vol. XXXIV.] LONDON, SATURDAY, MARCH 26, 1864. [WITH JOURNAL] STAMPED.... SIXPENCE. UNSTAMPED. FIVEPENCE.

PLAN OF THE GREAT WHEAL VOR MINING DISTRICT.



[Scale 132 fathoms to an inch.]

The paramount interest attaching just now to the district of Great Wheal Vor has induced us to present to our readers this week a sketch of the mine and its surroundings; and in connection with it we beg to observe that the direction of the lodes is given from a plan furnished to us from the Great Wheal Vor office, and laid down by the agents of that company in 1857, so that all feeling that they have been laid down for, or intended to apply to, any one new or particular sett adjoining—as the lodes in too many published sketches are—will be done away with.

In connection with the rich Wheal Metal lode, we are informed that Capt. T. Richards, who has been well acquainted with it and the district for 30 years, frequently, many years ago, urged its vigorous prosecution, and showed the advantages likely to result from it. Captain Richards also obtained a grant more than 12 months ago of the ground immediately adjoining, and alluded to in last week's Journal, under the name of West Wheal Metal; and of this sett the marked and distinctive features are, that it is between the great cross-course and the granite hill, in a settled and productive channel of ground; and the rich Metal lode runs through it and underlies north into the body of the sett 2 feet in a fathom, thus rendering it one of the finest speculations in the district. Wheal Emma, to the south of West Metal, has been worked by a local company, but the majority has now been bought up by parties in London.

Carleen, to the north of West Metal, made large returns when worked with Wheal Vor; and 5000*l.* worth of tin has been returned from the burrows since the mine stopped; and since that time also a large south lode has been discovered.

To the east of Wheal Metal is Sithney Wheal Metal (formerly worked by the Great Wheal Vor Company as Sithney Wheal Buller), on the Metal lode. There is a flookan course here, which has hitherto destroyed the lode, and disturbed the country around it so far as its influence extends; and, therefore, the heavy outlay made has been barren of results; but we understand the levels now going east are getting out of the influence of the flookan into settled ground, and likely to become productive. The 60 fm. level east, particularly, is improving. Of the sett, however, marked in the plan half only now belongs to Sithney Wheal Metal, the grant having been divided, and half is to be called North Wheal Metal. To the east of this is East Wheal Vor, and still further east East Wheal Metal, for both of which companies, we understand, have been formed. Great Wheal Fortune has paid dividends amounting to 10,338*l.* 10s., of which 4944*l.* 10s. was paid in 1863. Sithney Carnmeal, as will be seen by the plan, is a fine sett, on the Carnmeal lode (which also runs through Wheal Emma), and the prospects are very favourable.

The Miners' National Association.—The council of this body held its conference in London last week. The draft of the new Truck Bill, drawn up by Mr. M'Donald, the President, was read, and, with a few emendations and additions, was unanimously adopted. It was also resolved that no time should be lost in obtaining the consent of some influential members of Parliament to take it in charge. Mr. Shane, solicitor in the Edmund's Main compensation case, gave the council a brief account of the manner in which the questions at issue had been finally settled. The defendants, it appeared, had agreed to a compromise, according to the terms of which they were to pay over to Mr. Shane the sum of 1550*l.* means will thus be furnished for the relief of the sufferers and their families, after the law charges are defrayed. A petition in favour of the Government Annuities Bill, signed by the members of the council, was placed in the hands of Mr. Kinnaird, and duly presented by him in the House of Commons. Several members of Parliament were also personally waited upon and requested to support such measures as the council, on behalf of the miners, might deem it advisable to prepare. On Friday, Lord Townshend and Lord Kingsale had a long interview with the council, to discuss the details of the proposed plan for the appointment of a central executive committee to transact such parliamentary and other general business of the Association as could only be properly attended to in London. After their lordships had retired a resolution was passed agreeing to the appointment of a provisional committee with these objects, under the presidency of the Marquis Townshend. Lord Kingsale, Messrs. Zaba, Wright, Noel Sherryon, Alex Ross, Col. Townley, Col. Steward, Prof. Beesley, Thos. Hughes, Ludlow, Furnival, and Safford were elected members of the committee, with power to add to their number. Messrs. M'Donald, Mitchell, and the Rev. J. R. Stephens, members of the council, were also appointed to co-operate *ad interim* with the committee. It was also resolved that a draft code of laws and regulations for the government of the National Association of the Operative Coal, Lime, and Ironstone Miners of Great Britain, especially in reference to the proposed organisation of a London central executive, should be prepared and submitted to the council at the next meeting, to be then laid before the Conference of the Miners Delegates, appointed to be held in May next.

Mineral Wealth of Vancouver's Island.—At the Geographical Society on Monday, two papers were read on this district—in the first, Dr. Forbes, R.N., said that the south or Vancouver shore of the Sound of Georgia is now found to supply three seams, respectively 3 ft. 10 in., 5 ft., and 2 ft. 5 in., of a remarkably fine coal, which has already been worked at Nanaimo, destined before long to be the chief town, and British Columbia generally, and is traceable as far as the furthest north-west extremity of the island, where Johnson's Straits furnish excellent land-locked harbours. Up to 1858 the feeble and casual efforts of the Hudson's Bay Company had in nine years extracted for their limited market 63,000 tons of coal. But during the year last past 22,000 tons had been exported to San Francisco alone, where it found remunerative sale, though the price at the pits mouth is 26 per ton. Lieut. Palmer conducted his auditors to the gold fields, where he noticed the singular radiation of the more valuable gold claims, each lying in its own "gulche" or narrow torrent bed, six or seven of which diverge towards all points of the compass from one or two central isolated mountains. This, however, the President stated, showed that what had hitherto been found was mere alluvial or surface gold, washed down from the central or fried strata, the line of which was exemplified by a map exhibited on an enlarged scale, running nearly due north-west along the west side of the Great Rocky Mountain chain as far north at least as the Penn River. As, however, this last mentioned river runs eastward to join the Slow River, it is not improbable that drift gold may yet be met with on the east side. But the general direction, Sir Roderick Murchison held, of the main quartz gold-beds would be found to follow one uniform course.

Copper Mining in Canada East.—Much activity still prevails in the development of the copper and other mines of the eastern townships Apart altogether from the ascertained facts, and the success which has actually attended many of these adventures, the circumstance of their vigorous prosecution for so many years after the first mining excitement sprung up amongst us, affords reasonable grounds to infer their ultimate permanency and importance. It is much to be regretted that both Canadian and English capitalists have hitherto manifested so little disposition to embark extensively in enterprises at once so promising as investments, and so conducive to the best interests of the province. A powerful company, consisting of Boston capitalists and gentlemen belonging to this city, has been recently organised to open up copper mines on a rich mineral tract adjoining the celebrated Harvey Hill Mine, in the township of Leeds, Megantic county, about 40 miles south of Quebec. Operations are to be commenced immediately upon an extensive scale, under the superintendence of Mr. Herbert Williams, manager of the Harvey Hill Mine, a gentleman who is well known and justly esteemed by all interested in mining in this country, for the able and skilful manner in which he has conducted the operations at that mine, and whose experience thus acquired will be of inestimable value to the parties engaged in this new enterprise. This mineral region has attracted much attention from the peculiar manner in which the copper ores occur. The ores are of the richest quality, and found disseminated in thick beds of slate, interstratified with the rocks of the country, and appearing to extend indefinitely, both in depth and on the surface; such conditions being highly favourable for the persistence and regularity of the deposits, and rendering their extraction a much less hazardous, uncertain, and speculative

operation than is usual in mining. The metallic contents of these beds are said to average about 5 ft. in thickness, and 3½ per cent. of copper—amply sufficient to yield a profit upon their extraction; and in the extensive operations at Harvey Hill Mine we are told that they increase both in thickness and richness on being traced in depth, while there are found associated with the beds rich bunches or veins in which the ore occurs in a highly concentrated form. It is proposed to continue the projected railway to the Chandière valley to Leeds, which will be of great importance to the Harvey Hill and neighbouring Mines.—WILLSON AND ROBB: Montreal.

PERFECTION OF THE PRINTING TELEGRAPH.

Although the greatest advantages have accrued to the commercial classes of all countries by the introduction of electric telegraphy, it has ever been felt that a means was wanted of enabling the sender of a telegram to ascertain that his message has been accurately delivered to his correspondent, without the delay and expense of returning the message; the consequence is that any improvement in the means of securing economy and accuracy in the despatches is regarded with quite as much interest by the general public as the man of science. The amount of accuracy already attained is, considering the imperfect appliances that have hitherto been at disposal, beyond all praise; but, owing to the circumstance that telegrams are necessarily concise, the smallest possible error may lead to almost incalculable inconvenience. It has been the knowledge of this fact that has induced the strenuous efforts of ingenious inventors to provide a means of telegraphing which shall enable the message to be delivered to the senders in a legible form precisely as transmitted by the instrument, thus avoiding the possibility of errors in reading the instrument or transcribing the message, and Bonelli, the well-known Italian electrician, has at length succeeded in providing the desideratum: his invention being apparently fully entitled to the claim that has been put forward for it—that it is the perfection of the printing telegraph.

The history of the progress of electric telegraphy during the last century and a-half would form an interesting study, and comparatively few of those who now employ the telegraph as an indispensable necessity to their every-day business, are aware of the very meagre results which were regarded as marvellous even at the beginning of the eighteenth century. It was only in 1729 that Grey and Wheeler first observed the instantaneous discharge of electricity through a few hundred feet of wire; and it was some 20 years after that Winckler of Leipsic, Nollet Lemonnier of Paris, and Bishop Watson of Llandaff, succeeded in transmitting currents through wire a distance of more than two miles, and it will not be uninteresting to mention a few of the inventions which have from time to time attracted attention, with a view to show the advances that have been made, and prove that important improvements are not impossible. Passing over Strada's account of the existence of a magnetic telegraph previous to the sixteenth century, the first real attempt to render electricity available for the transmission of signals appears to have been that of Lesage, a Frenchman, who in 1774 established an electric telegraph at Geneva, with 24 conducting wires, to correspond with the letters of the alphabet, each conducting wire communicating with a distinct electrometer, formed of a small ball of elder, suspended by a wire. Now, at this time the transmission of a word a minute on the average for a quarter of an hour would have been regarded as a feat which could scarcely have been accomplished by anything short of a miracle, yet at present we hear of messages being transmitted at the rate of 40 words a minute by the ordinary needle telegraph, and are still dissatisfied with the speed attained—to remove the cause of dissatisfaction, Bonelli offers us a system which shall enable us to have direct from the instruments messages as legible as an ordinary newspaper at the rate of 1000 words per minute, and as an influential company has been formed for developing the invention in this country, it may reasonably be anticipated that before many months have passed all our great commercial towns will be placed in direct communication by Bonelli's printing telegraphic system.

The idea of printing telegraphs is almost as old as telegraphy itself, the telegraphs of Morse, Bain, Bakewell, and a host of other early inventors, being printing telegraphs, but there have always been objections to them, which have prevented their adoption—either the number of wires necessary has been too large to be practicable, or their accuracy could not be depended upon, or the printing could only be read by the receiver, and caused the needle instrument to remain in favour. These objections Bonelli seems entirely to have removed: he prints the message at the transmission end of the line, he uses five wires only, and inaccuracy is practically impossible. The transmitting and receiving instruments are similar in appearance; each consists of a table about 6 feet long, and 1½ ft. wide, along the centre of which runs a miniature railway, terminated at the end by a spring-buffer, and spanned midway by a bridge about 6 inches high and 3 in. wide. Upon this railway is placed a wagon, about 3 feet long and 5 in. wide, 3½ in height, running upon four wheels; on the surface of this wagon are two long rectilinear openings—the one opening the forward half, and destined to carry the message which is to be sent, the other occupying the latter half, and intended for the message to be received; upon the bridge are two small metal combs, each containing five insulated teeth, answering in number to, and connected with, the insulated conductors of which the line is formed. The combs differ from one another, the one which is to dispatch the message, formed of teeth, having a certain freedom of action, is on the side of the bridge farthest from the operator; the other, or writing comb, consists of a similar number of teeth fixed in a block of ivory, and forms a perfect line, resting with a slight but regular pressure transversely on the paper.

The message to be transmitted is set up in type, and, when a line the length of the opening in the carriage is finished, placed on the wagon, which now stands at the upper end of the rail, and is held there by a simple catch, and in the second opening is placed a plate of metal, upon which has been laid a few strips of paper prepared with a solution of nitrate of manganese; this done, the operator turns a small handle, and the wagon being at once freed from the catch, is set in motion by a simple weight, the pace being regulated by a fan; the type is thus brought under the action of the dispatching comb, and runs lightly under its teeth from end to end; one-half of the journey being made, the writing comb comes in contact with the prepared paper. If the operator at the other end has had a message to send it will have been printed in clear legible characters, of a deep brown colour, the form of the letters corresponding exactly with that of the type from which it is transmitted; and it is to the circumstance that exact correspondence between the two instruments is not absolutely necessary that the great value of the Bonelli telegraph, as compared with other printing telegraphs, is to be attributed. With the majority of printing telegraphs the synchronism of the transmitting and receiving instruments must be absolutely perfect, or the message will be unintelligible, since an S transmitted may be recorded R or T, through the slightest possible deviation in the speed of the two instruments; but with Bonelli's system this evil does not exist, the sole result of difference of speed being a trifling difference in the form of the letters recorded—thus, if the transmitting wagon move too quickly, the letters recorded will have a longitudinally compressed form, whilst, if it moves too slowly, the recorded letters will be widened, but in all cases they are received and legible. It is proposed, as we understand, to reduce the tariff to the uniform rate of 6d. per message of 20 words, so that the enterprise is unusually well entitled to general favour.

TREATING SULPHURETS OF GOLD.—It appears that Messrs. Keith Mohler, and Co., of New York, have succeeded admirably in treating sulphurets by a desulphurising process, invented by Dr. B. Keith. After remedying the slight imperfections which existed in the first instance, they crushed one cord (14,700 lbs. by actual weight) of second quality ores from the Gregory lode, such as have hitherto yielded only $100 per cord by the usual method. This, after being desulphurised and calcined, weighed only 8871 lbs., or but little more than one-half the original amount, the waste, composed of sulphur and other volatile substances, having passed off in vapour. The ores, after being thus treated, were run through a Frieburg pan for amalgamation, and yielded 36 ozs. of superior retort, worth $864 in currency. This, as will be seen, is nearly nine times the amount formerly obtained. The result is a very flattering one to the people of Colorado, as the practicability of this method is now fully demonstrated. From 80 to 90 per cent. of the gold can by this method be constantly saved from the ores. It also enables their people to work successfully a class of ores well known to be rich, but from which they have hitherto failed to separate the gold on account of the presence of arsenic, antimony, and other metals and substances which are readily volatilised.

GOLD EXTRACTION.—Improvements in the mode of extracting gold applicable to almost every describtion of ore having been introduced, much of the mineral previously thrown aside as useless can now be profitably treated. The apparatus of Mr. Goulding, with whose name the readers of the Journal are already familiar, has proved very successful in Australia. The agent of the Eagle Hawk Cement Company reports that experiments with Mr. Golding's amalgamating pan and separator gave the following result:—11 tons of tailings which had previously passed through the amalgamating barrel, and which took three days and a half (day time only) in reducing, produced 5 ozs. 8¼ dwts. of gold, and they saved besides 23¼ ozs. of quicksilver in the separator. A large work has been undertaken by Messrs. Stewart and Farnsworth to supply the miners of Talbot with water, and in which they have cut some 60 miles of races, and have partially constructed a reservoir, 120 ft. broad at the bottom, 40 ft. at the top, and 120 yards in length, which receives the drainage of 100 miles of country. The opinion that the gold reefs of Australia do not hold rich in depth appears to be altogether fallacious, since from a claim on the Arndt Reef, at Havelock, from 23 tons of quartz crushed by Hansen's machine a yield was obtained of 75 ozs. 14 dwts. of gold, or over 3 ozs. 5 dwts. to the ton. This quartz was taken from a depth of 25 feet below water level, and shows an increase as the sinking has gone deeper. At no part of the reef above the level of the water has the yield at any time exceeded 1½ oz. to the ton, and so far from being poorer the stone has gradually improved in richness. In California, Mr. P. M. Randall, of San Francisco, claims, as an improved apparatus for reducing quartz pulps and amalgamating gold, a rotary muller, provided at its face side with grooves of involate or other form, which will force the substances to be acted upon from the periphery of the muller towards its centre, and thence upward through the muller, so that the substances may be expelled again, by centrifugal force, toward the periphery of the muller, and thence again underneath, to be again forced toward the centre as before.

ECONOMIC LIFE ASSURANCE SOCIETY.

The ordinary annual court and extraordinary quinquennial general cou rt were held at Radley's Hotel, Bridge-stree:, Blackfriars, on March 19, Mr. H. BARNETT in the chair.

Mr. ALEXANDER MACDONALD (the secretary) read the circular convening the courts, which were for the following objects:—To consider and receive the auditors' report for the year 1863; to elect auditors for the present year; to consider and receive the report of the directors upon the value of the funds of the society and its engagements, and the valuation of the policies prior to declaring a bonus; to declare the sum to be allotted to the members of the society as a bonus; and to elect four directors, in consequence of the following going out of office, by ballot:—The Right Hon. E. P. Bouverie, Messrs. Henry Barnett, Edward Charrington, Pascoe Charles Glyn. These gentlemen being, by the 153d article of the Deed of Settlement, immediately eligible to be re-elected, are recommended severally by the board of directors.

The CHAIRMAN said, before proceeding with the formal business of the day he would refer to the circumstances under which he occupied the chair upon the present occasion. Most of those, if not all, present were doubtless aware that by the hand of Providence the society had been during the past few weeks deprived of its chairman and deputy-chairman. He was sure that all present sympathised in the sorrow felt at the absence of those familiar faces, to see which they had been accustomed for a great number of years. It had been his good fortune to sit at that board with Mr. Routh and Mr. Biddulph—he now spoke of them in the order in which they had been taken from them—for no less a period than a quarter of a century, and he could, therefore, bear the most satisfactory testimony to the zeal and ability with which those gentlemen had attended to the affairs, and to the deep interest they took in the welfare, of the Economic Society. Mr. Routh was taken from them but a short period since, but he had arrived at that age—nearly 80—that he could hardly have been spared much longer, but his sagacious intellect was unimpared to the last. Mr. Biddulph, the oldest member of the society, had occupied a seat at that board for nearly 40 years, and was removed by the hand of death when in the full vigour of body and mind, having within a few days of his death looked forward with great interest to this meeting. He (the Chairman) did not know that he need allude further to these painful circumstances, for he was sure all present felt they had sustained a great loss. In endeavouring to fill in a manner that would be satisfactory to both the directors and the policy holders the vacancy thus occasioned, they had selected Mr. A'Court Repington, secretary of the National Debt Office—a gentleman whose position and qualifications rendered him peculiarly well fitted for the office; and in the place of Mr. Biddulph the directors had selected his son, who had been associated with his father in the bank for many years, and was largely assured in this office. (Hear, hear.) Having made these few remarks, he would call upon the secretary to read the statement of receipts and disbursements for the year 1863.

The SECRETARY then submitted the following statement of accounts for the year ending Dec. 31, 1863:—

GENERAL ACCOUNT.

Received—Assurance premiums		£206,525	6	3				
	Less commission	7,183	6	1	= £199,342	0	2	
"	Interest on investments	92,199	8	0				
	Less income tax	3,086	1	6	= 89,113	6	6	= £288,455 6 8
Paid—Assurance claims					£163,107	17	11	
"	Annuity claims				1,810	10	0	
"	Policies purchased				2,154	16	0	
"	Re-assurance premiums				324	16	4	
"	Office expenses				7,758	4	7	
"	Medical fees				305	11	0	
"	Balance carried to investments				112,993	10	10	= £288,455 6 8

ASSURANCE FUND.

Balance, Jan. 1, 1863—Funded property					£618,931	17	2	
	Loans on policies				82,324	3	0	
	Mortgages				1,351,980	10	7	
	Life interests				57,734	17	9	
	Reversions				28,006	0	0	
	Cash on hand and on deposit				16,950	1	4	
	Reversions, &c.				4,299	7	4	
	Balance from general account				112,993	10	10	= £2,273,220 8 0
Terminable annuities, &c.					£ 834	17	0	
Balance, Dec. 31, 1863—Funded property					590,816	16	8	
	Loans on policies				88,175	3	0	
	Mortgages				1,458,251	5	0	
	Life interests				52,050	14	4	
	Reversions				31,407	2	0	
	Capital on hand and on deposit				51,684	10	0	= £2,273,220 8 0

Examined and found correct { JOHN G. STILWELL, RICHARD TAYLOR,
(Signed) { JOHN HOWELL, HENRY ROBERTS.

AUDITORS' REPORT.

The auditors of the Economic Life Assurance Society, having carefully examined the accounts laid before them, do report that they are correct. They consider it impossible to enter into all the minute calculations of the actuary as to the assets and liabilities of the society, but are satisfied with the principles adopted in preparing those calculations, and the preparation of which has been attended with great labour. Comparing the present with the preceding quinquennial audit, they are able to assure the members of the continued prosperity of the society. { JOHN G. STILWELL, RICHARD TAYLOR,
(Signed) { JOHN HOWELL, HENRY ROBERTS.

The CHAIRMAN proposed that the statement just submitted be received, adopted, and entered on the minutes.——The Right Hon. E. P. BOUVERIE, M.P., seconded the proposition, which was put, and carried unanimously.

The sum of 160*l.* was awarded to the auditors for the audit during the past year.

The quinquennial court was then opened by Mr. O. G. DOWNES, F.R.A.S. (the actuary), reading the eighth quinquennial report of the directors, as follows:—

The directors of the Economic Life Assurance Society feel much pleasure in presenting to its members their report of the result of the investigation made into the affairs of the society at the close of the quinquennial period which terminated on Dec. 31, 1863. Since the last division 2641 policies, assuring 2,050,788*l.*, have been issued, giving an annual average of 528 policies, of 777*l.* each—a large and steady increase of the business. The sum of 72,702*l.* has been received during the five years in new premiums, being at the rate of 14,540*l.* a year. The total income from premiums, which in the year 1859 was 182,429*l.* now amounts to 214,104*l.*, indicating an annual average increase of 4385*l.*, after allowing for loss of income from discontinued policies; whilst the gross income from all sources has increased at the rate of 10,230*l.* per annum. Claims have arisen during the five years on 794 policies, assuring 624,327*l.*, and carrying bonuses to the amount of 116,899*l.* In addition to the bonuses on policies upon which claims have arisen, the sum of 87,149*l.* has been paid as bonus in other ways, such as in reduction of bonus liability by cash payment, reduction of premium, purchase, &c., making a total of 204,048*l.* In the valuation of the assets an ample margin has been allowed for possible fluctuation of the funds, and in the valuation of the liabilities the *risk* premiums only have been taken into account. The remaining portion of the premium income, after defraying the expense of management, commission, &c., will accumulate till the next division, when the amount realised will be found in the surplus. By this arrangement old and new assurers contribute rateably to the expenses of management, and no profit is declared by anticipation. The assets, consisting of funded property, mortgages, life interests, and reversions, premiums due on December 31 (since paid), interest accrued on investments, balance at bankers and in hand, amount to 2,315,129*l.* 19*s.* 2*d.* The liabilities, consisting of the values of policies and the bonuses already declared, claims accrued in 1863 but due in 1864, commission, taxes, and sundry small accounts, amount to 1,964,739*l.* 1*s.* 7*d.* There is, therefore, after making provision for every known liability, a surplus of 350,390*l.* 17*s.* 7*d.* The directors recommend that 329,890*l.* of this surplus be distributed as absolute bonus; and that the remainder, 20,500*l.* 17*s.* 7*d.*, be retained for the payment of annual, contingent, and conditional bonuses. It is further recommended that out of this sum of 20,500*l.* 17*s.* 7*d.* an annual contingent bonus of 1*l.* per cent. per annum be added to the absolute bonus on such policies, now entitled to participate, as shall become claims during the current quinquennial period, viz.:—

On policies which shall become claims in 1864,	1*l.*	per cent. on sum assured.		
"	"	1865,	2*l.*	" "
"	"	1866,	3*l.*	" "
"	"	1867,	4*l.*	" "
"	"	1868,	5*l.*	" "

To those policies which are not entitled to participate in the present bonus, by reason of five annual premiums not having been paid upon them, but on which claims may arise after the payment of the fifth annual premium and before the next quinquennial investigation, they propose to add a bonus of like amount as if five annual premiums had been paid prior to the present division. The sum of 329,890*l.* will produce reversionary bonuses amounting to 506,300*l.*, yielding a percentage ranging from 5 to 34, or 9½ on the average of the sums assured; and a percentage ranging from 26 to 160, or 59¼ on the average, on the premiums received in respect to which the bonus is allotted. The same options are offered as at the last division, and so the present bonus may be taken either—1. In money.—2. In addition to the sum assured.—3. In a reduction of the premiums for five years only.—4. In a reduction of the premiums for the remainder of life. The society now assures by 9022 policies the sum of 7,233,564*l.*, and has an assurance fund amounting to 2,272,385*l.* 11*s.*, and an annual income of 307,475*l.* The large number of assurances in force affords a protection to the society against those deviations from the average which attend a paucity of numbers, while the respective amounts of the capital and the income attest the firm and satisfactory condition of the society. The experience of the society during this period (the fourth which has elapsed since paying off the shareholders) has fully realised the expectations of the directors, and they feel assured that the members will share their satisfaction.

The CHAIRMAN said, from the enthusiastic manner in which the report just read had been received, it was not altogether unsatisfactory. (Hear, hear.) The Economic Assurance Society had been now 40 years in existence; at the expiration of the first 20 years they had paid off their shareholders; from that time the concern had been going alone, and had now arrived at a tolerably mature age. The quinquennial investigation into this society's affairs now became exceedingly interesting, because it had been in existence sufficiently long to test the accuracy of the foundations upon which the society rested. During these 40 years it was satisfactory to observe that the society had made steady progress—their capital had been rolling up, and they had now to deal with very large figures. The assets of the society had accumulated to 2,300,000*l.*, which was a very large sum, and the premium income amounted to 214,000*l.*, the total income being 307,000*l.* The accumulations, therefore, in comparison with the last quinquennial statement, shows that there had been an increase to their property of 475,000*l.*—that is, in addition to the sums paid as claims, and in reduction of various liabilities. As regards their liabilities, they had no hesitation in saying that they owed rather a large sum, their liabilities being 7,200,000*l.*; but when that came to be investigated a little more closely, it would be found that the present value of that large sum was 3,359,000*l.* For they had in hand 2,315,000*l.*, and five years' purchase of the society's premium income would provide the whole of the sum necessary to meet the valuation of their liabilities. That, he submitted, was a very satisfactory position to occupy, and one that he was inclined to think would satisfy even the critical mind of the Chancellor of the Exchequer. (Laughter.) In point of fact, their assets amounted to no less than 30 per cent. of the whole of their liabilities. (Hear, hear.) He need hardly say that to thoroughly investigate such matters as these involved a considerable amount of labour, but they relied most implicitly upon the intelligence of their actuary (Mr. Downes), who had shown great diligence and skill in bringing out these figures, and the board had every confidence that the surplus now presented was actually divisable among the policy holders. The present bonus amounted to 329,800*l.* in hard money, which in reversion would produce 506,000*l.*, which was a very large sum. In 1858 the total divisable sum was 304,000*l.*; therefore, upon the whole they had now nearly 25,000*l.* more to divide than at the end of the last quinquennium. (Hear, hear.) As the business had rolled on during the last five years there had been 2600 policies added, and 1400 had ran off. It would be observed in the report that the average bonus now proposed to be declared on the premiums received was 59½ per cent., against 65 per cent. at the quinquennial meeting. That might appear at first sight a little startling, and some might regard it as an indication that they were not retrograding, but the explanation was perfectly satisfactory. For, in point of fact, that amount was spread over a much larger surface. It was an average—they had young lives at the one end and old lives at the other; and unless they could get the old lives to go off as fast as the young lives came in, there would necessarily be a variation reducing the average, but in favour of the old lives. The bonuses were, however, accumulative, and as time rolled on the young lives would gain the advantage. The standard of comparison varied from time to time, but the collective premiums now amounted to 849,000*l.*, whereas at the end of the last quinquennial period they amounted to 730,000*l.* There were some 100 policies still in existence that were issued during the first three or four years of the society. The number of policies issued during the last quinquennial period was 2641, as against 2578 in the previous five years, and the amount assured by them was 2,050,000*l.*, as against 1,875,000*l.*; that was not altogether unimportant. The average number of policies per annum was 528, as against 516 in the former period; the average amount of each policy was 893*l.* This led him to the conclusion that so far as they were concerned they need not take much heed of the Government Annuities Bill. (Hear, hear.) It was perfectly clear that the Chancellor of the Exchequer was going into a description of business which this office did not at all covet, and they were willing to leave him to carry on his scheme as best he could. It was no doubt the duty of a "paternal Government" to look after the interests of the industrial classes, and it was not right for them to complain that Mr. Gladstone, doubtless actuated by a *bona fide* intention, had taken upon this subject. Small policies such as the Government contemplated did not pay as well as large ones. The Economic Society issued policies as low as 100*l.*, but they did not like them, experience having shown that the larger the amount of the policy the better for the office, the premium being calculated upon the average risk of life, and provision being made for expenses and a fair margin of profit. Suppose, for instance, the margin for expenses and profit was taken at 20 or 25 per cent., if a life were insured for 100*l.*, at an annual premium of 4*l.*, 1*l.* would go every year for office expenses, and any balance that might accrue as between that charge and the actual proportion of office expenses belonging to the policy would accumulate for the benefit of the policy holders generally. But if the society insured a life at the same age for 1000*l.*, at an annual premium of 40*l.*, there would get 10*l.* each year towards the expenses of management, and as the cost to the office would be the same, there would be so much more left to accumule for the general good. It was found that the average cost of each policy to the office was about 1*l.*, and the Chancellor of the Exchequer showed that he was well informed upon all these points when he stated that the Government would be compelled to charge a higher rate of premium than the average of ordinary insurance offices. The Economic Society charged a lower rate than the average, and some years ago it was thought that their premiums were calculated at too low a rate, and that the office was not quite safe in consequence; but during the 40 years it had been established they had paid back 30 per cent. to the policy holders without reference to the average, besides making ample provision for all liabilities. The total amount declared in bonuses since they started was 1,365,000*l.* (cheers)—of which amount they had redeemed by cash payments, lives dropped in, and other ways 803,000*l.*, leaving still ontstanding 562,000*l.* They were now adding over 500,000*l.* to that amount, making in round numbers about 1,000,000*l.* of liabilities in bonus on existing policies, which they were quite prepared to pay as those policies fell in. Another favourable feature in the business of the society was that policies were taken out on older lives than formerly, yielding a higher rate of premium, and showing that the value of the office had been maturely considered by the insuring public. (Hear, hear.) It was difficult, from the uncertainty of life, to arrive at an average bonus, but he might state that the highest they had paid was upon a policy of 2500*l.*, taken out at the age of 54, on a life that fell in at the age of 83. To the representatives of that life the directors had the satisfaction of paying over the sum of 2171*l.* besides the 2500*l.*, or 87 per cent. on the premiums paid. At the other end of the scale, on a life that dropped in very early, the policy carried only 5½ per cent. bonus. The funds at the office arising from the accumulation of premiums had been invested at an average rate of 4*l.* 4*s.* 1*d.* against 4*l.* 2*s.* 4*d.* in the year 1858. This might appear a small rate of interest, looking at the high value of money lately, but the board of directors were tied down to the Funds and other investments which paid a low rate of interest, but were free from risk, and he added that the office had not made a single bad investment or bad debt since he had known it. (Hear, hear.) The directors took credit for the economy exercised in the conduct of the business of the office, the total expenses not exceeding 2½ per cent. on the gross income. (Hear, hear.) He then mentioned that negociations were in progress for taking over the business of the Amicable Society, upon terms which would be perfectly safe for the Economic, and after paying a high compliment to the actuary (Mr. Downes), and the secretary (Mr. Macdonald), for their zeal and attention, he concluded by moving the adoption of the report.——The Right Hon. E. P. BOUVERIE, M.P., seconded the motion.——A POLICY HOLDER congratulated the society on the reduction in the percentage of claims, as compared with previous years.

The CHAIRMAN (in reply to a question) stated that the reason the Amicable wished to transfer their interest was that they were so cramped by their constitution that they could not get new business. The new business which would come from the Amicable would reduce the rate of expenses and add to the profits. The directors had the power to take over the business of the Amicable without consulting the policy holders. It was in effect merely taking over so many additional policies at a premium that would be remunerative. It was not an amalgamation in the ordinary sense of the term.—Mr. BOWLEY regarded it as one of the highest compliments that could be paid to the Economic that it would be selected by the Amicable.

Mr. WYLDE enquired if the directors had power to invest the society's money in other than Government securities?—The CHAIRMAN said, under the Deed the directors were restricted to certain investments, but there were certain absolute clauses in the Deed which it was though desirably to rescind or modify. He, for one, approved of the Indian guaranteed railways as a safe security.

A POLICY HOLDER had seen it stated that the Economic were about to pay a certain sum of money to the directors and officers of the Amicable. He should like to know if such were the case?——The CHAIRMAN said he could give that statement the most public denial.

The Right Hon. M. BOUVERIE, M.P., in reply to an observation from Mr. Wylde, read the opinion of Prof. De Morgan with regard to the Economic Society, which was to the effect that "The calculations are made upon a very hard and safe plan." (Hear, hear.)

A POLICY HOLDER suggested that the Economic should pay, as other offices, claims at the end of three months after death instead of as now six months.

The CHAIRMAN said that would involve an alteration in the Deed of Settlement. The calculations were made upon the basis that the policies were to be paid in six months, and the interest on the money in the meantime formed part of the profits of the society. The other offices that paid in three months charged higher terms. The board were, however, always ready to discount policies at a uniform rate of 5 per cent. It was thought that the arrangement by which a fixed rate of bonus was paid on policies falling due previous to the quinquennial period was an advantage to the policy holders. The number of policies issued last year was 491.

A POLICY HOLDER thought that the favourable terms which this society offered to the assured, as compared with other mutual offices, should by some means be made more publicly known.—The motion adopting the report was put and carried unanimously.

The resolution that the sum of 329,890*l.* should be distributed as bonus among the policy holders was put and carried, as was also the motion that 1 per cent. per annum should be paid as additional bonus on policies becoming claims during the ensuing five years.——Notice was given by a POLICY HOLDER of a motion for a future meeting, to increase the remuneration of the directors from 1500*l.* to 2000*l.* per annum.

The retiring directors were unanimously re-elected.

Thanks were voted to the Chairman and directors, and also to the actuary and secretary, when the meeting separated.

ATLANTIC TELEGRAPH.—It appears that the scientific committee appointed to consider the best form of cable for submersion between Europe and America have recommended the one prepared by Messrs. Glass, Elliot, and Co., No. 46. The conductor consists of a copper strand of seven wires (six laid round one), each wire gauging 0·144 of an inch, and the strand 0·444 of a inch, and weighing 300 lbs. per nautical mile, embedded for solidity in Chatterton's compound. The conductor of the old cable of 1858 consisted of six wires laid round one, being about half the gauge of the new one, and weighing only 107 lbs. per nautical mile. The insulator of the new cable is to consist of gutta-percha, in four layers, between each of which is to be a thin layer of Chatterton's compound, making a diameter of the core of 0·464 of an inch, weighing 400 lbs. per nautical mile. The insulator of the old cable was formed in three layers, and weighed 261 lbs. per nautical mile. The external protection of the new cable is in two parts—first, the core is surrounded with a padding of soft jute yarn, saturated with a preservative mixture; next this padding is the protective covering, which consists of ten solid wires of the gauge 0·095 of an inch drawn from homogeneous iron, each wire being surrounded separately with five strands of Manilla yarn. The whole of the ten strands thus formed of the hemp and iron are to be laid spirally round the padded core. The external protection of the old cable consisted of 18 strands of charcoal iron wire (each strand was composed of seven thin wires), laid spirally round the core, which latter was previously padded with hemp saturated with a tar mixture. Each wire strand was of No. 14 gauge, entirely unprotected from the action of the sea water. The weight of the new cable is to be 35¾ cwt. per nautical mile, while that of the old one was 20 cwts. The breaking strain of the new cable is 7¾ tons, and of the old cable 3¼ tons. The strength of the new cable is to be equal to 4·64 times its own vertical weight in the deepest water (2400 fathoms), while that of the old cable was only 2·05 times the strength requisite for the deepest water. The scientific committee recommend various precautions to be adopted for laying the core, the joints, and other parts of the cable during its manufacture, and when completed, so as to insure, if possible, the utmost success.

OBTAINING IRON FROM ITS ORE.—In the ordinary method of obtaining iron from its ore, the stone or ore is calcined, then mixed with coke, coal, and limestone, and afterwards submitted to the action of a hot or cold blast-furnace. Mr. Silvester Ingledew, of Stockton-on-Tees, proposes to obtain the iron from the ore without the aid of a blast-furnace, and consists, first, in reducing the ore by grinding or pulverising in an ordinary grinding apparatus, or one suitably arranged for the purpose, it is then to be placed in a perforated rotating chamber or receptacle, through which water passes, wherein the heavier particles of granulated metal are precipitated by gravity to the bottom, the lighter earthy and other matters being carried off by the water. This residuum of washed granulated iron ore (which still retains a small quantity of silicate and silicate of potassium) is then conveyed to an open flat vessel or "drying frame," where the moisture is evaporated therefrom, and it is afterwards passed into an ordinary air or reverberatory furnace, by which it is reduced to cast metal. In order to regulate the quality of the iron, he employs, in connection with the granulated iron from the drying frame, any necessary proportion of alkaline earth, alkaline bases, and carbonaceous matter, which will have the effect of chemically combining with any extraneous matter, so as to facilitate the separation of the iron, and so influence the quality of the same as to render it applicable to the production of bar-iron, plates, or other descriptions of manufactured iron.

The contract for the manufacture of the rolled armour plates for the after body of the "Lord Warden," iron-cased frigate, building at Chatham, has been taken by Messrs. John Brown and Co., Atlas Works, Sheffield, at 39*l.* per ton.

ON THE VENTILATION OF MINES.

[Notes from a Lecture delivered by Prof. W. SMYTH at the Royal School of Mines.]

The subject of ventilation has always been particularly attended to by miners; and even 300 years ago there were some good methods of ventilating metalliferous mines. Of all such early modes the simplest is that represented by Agricola of the shaking a sheet, either to brush away any nauseous gas in the workings, or to create a current. This same method is used even now in some of our collieries. In speaking of ventilation, we have to consider first the causes which render it necessary to produce a current of air for ventilation; secondly, the modes of producing the current; and, thirdly, the methods of guiding the current when produced. First then, the necessity for ventilation arises from different causes, and, therefore, different classes of ventilation are required, according to the difficulties to be overcome. The necessity for ventilation arises usually from stagnation of air in mine workings, either horizontal or vertical. In some cases we can drive only a few yards without its aid, in others we we may drive long distances without in any way requiring it. In all cases, however, ventilation is necessary, when we descend to any depth below the surface, from the increase of the temperature, the result of a variety of causes. The air in the workings becomes vitiated by the breathing of the men and of the horses, by the blasting and smoke of the gunpowder, by the combustion of the lights—causes continually in operation, and all tending to render the air impure. Another source of foul air is the continual chemical changes going on in most mines, changes that absorb, to a great extent, the oxygen of the air. These chemical changes may either take place in the country itself, or in the films of decomposed minerals, common in all mines, whether metallic or otherwise. Then, again, we have the decomposition of organic bodies, such as wood, so abundantly used in most mines. The decomposition of wood is a good proof, if proofs were wanting, of the changes continually in action in all mines. Attending the decomposition of these different bodies we have the formation of others, such as the sulphates of iron and alumina. Moreover we have the peroxidation of certain irony minerals and compounds. Lastly, we have the emanations of certain gases from rocks, and especially from the older rocks, in districts near centres of volcanic action. Under this head we have carbonic acid gas and carburetted hydrogen, which is the most dangerous of all gases found in mines, and the most common in collieries.

Now, these vitiating circumstances being all found in certain mines, we have to produce in each case a ventilation in proportion to the vitiating force. The ventilation required will be in proportion also to the number of men employed. In considering this, there is a great difference between the disposition of the men in collieries, and their disposition in metalliferous mines. Casting a glance over the plan of a colliery, we shall see that the men work all more or less in one plane, and that, consequently, a large supply if air must pass in that one direction. Now, in metalliferous mines the case is quite different, for we have the men there dispersed throughout the mine, some in shafts, others in levels at different depths, and no large number working in any one spot; consequently, the current of air required at any one part of the workings is not very great. From this the ventilation of metalliferous mines is left, in a great degree, to chance, as only in the close ends a deficiency of pure air is felt, and in such places there are never more than two or three men working at a time. Now, in a colliery, on the other hand, artificial ventilation is generally needed, although the extent of the workings may not be greater than that of the metalliferous mines, which requires none. The use of the fan, as a mode of producing a current of air in mines, we may trace back to the days of Agricola, when such instruments were driven by a water-wheel. Ignorant persons now-a-days continually propose the fan as a new idea for ventilating collieries, and advise that the air so produced be conducted through the workings in gas-pipes. Any such supply would be totally inadequate to colliery ventilation, although it may answer well in metalliferous mines. Besides the advantages from a scattered distribution of the workmen, which metallic mines have over coal mines in the supply of currents of fresh air, there is still another—that in metalliferous districts the ground is generally undulating, admitting the use of adit levels, or of making one shaft longer than the other, and so of setting up spontaneous ventilation. Now, in the coal districts the country is generally flat, and, therefore, there is no determining cause to produce a current.

In undertaking the subject of ventilation, it is very desirable to be reminded of the vitiating forces the miner has to contend with, as also of their nature and characters. As, for example, the fluidity, weight, and elasticity of some gases, the poisonous nature and inflammability of others, found emanating from different rocks in mineral ground. In the condensed air of a mine there are a variety of substances floating, as the smoke of the gunpowder and candles, the dust from the boring, which is peculiarly injurious in attacking the health of the miners, as well as many other bodies. Besides the vitiation of the air from gases given off from rocks, and from gases the products of combustion, we have other deleterious vapours present, as sulphuretted hydrogen, vapours of mercury and arsenic, especially found in the mines of quicksilver and arsenic. That these unhealthy influences exist in mines we can have no difficulty in proving, as the fact is well established that the length of life of the miner is less than that of any other class of the community. We can, then, but regard the subject of ventilation as one of paramount importance in mining.

It may be well now to examine the different gases met with in mines, and to consider them in the order of their specific gravity. In spite of all that Prof. Graham has written about the diffusion of gases, it is found in practice that in mines gases do not diffuse so quickly as to prevent our noticing invariably that some gases are always found near the roof of a level, others always at the bottom. Colliers know this well, and take good care not to raise their candles to the top of the level, where the inflammable gases are always found. The principal gases of mines are carburetted hydrogen, nitrogen, and air, all of which tend to rise more or less to the top of the level. Then we have sulphuretted hydrogen, carbonic acid, and water, which tend to flow downwards to the lowest level.

The heaviest of all these gases is carbonic acid gas, of which the specific gravity is 1·524; it is sometimes met with pure, but generally impure. When mixed with air, to the extent of 5 or 8 per cent., it is difficult to carry on combustion with candles in it; and, if 10 per cent. be present in the atmosphere, the candles go out completely, and the air becomes dangerous to breathe. Beyond this amount death immediately results on inhaling it. As regards the cases in which carbonic acid is found, we often hear of people going down into an old well, and instantaneously falling dead from the carbonic acid present. Such incautious conduct is much to be reprehended. Carbonic acid gas is often found in old unfrequented mine workings, and before entering such places it is always wise to test the purity of the air by seeing whether a candle will burn in it or not. There are some few mines in which carbonic acid is given off from natural fissures in the rock, as from the granite in the mines of Auvergne. In some of the thick coal of South Staffordshire the old mine workings are very dangerous from this source, and, although they may be divided from the parts now being worked by stillings, the carbonic acid gas frequently finds its way through such a barrier. As a means of getting rid of carbonic acid gas we may have ventilation by natural or artificial causes. Other means have been proposed for the purpose, such as the use of chemical agents, some of which may be applicable where the amount of gas is small. Of these agents we may mention quick-lime as one commonly used for absorbing the carbonic acid gas, but where the gas issues from fissures such a method is quite useless. Small quantities of this gas are sometimes got rid of in collieries by taking some branches of trees, and tying them to sticks, which are then drawn up and down the shaft, and so pump the bad air out. The most satisfactory method, however, of dealing with large quantities of carbonic acid gas is that carried out by the French miners in the South of France, where they turn into the foul air a jet of steam, as steam at a high temperature absorbs this gas perfectly.

The next gas in our list is sulphuretted hydrogen. It is not commonly found, although we are often told of its occurrence, but rarely has its presence been satisfactorily proved. One remarkable instance of it occurred at the Townley Colliery, some years ago. The colliery is situated in the outcrop of the coal measures of North Durham. The gas was sufficiently strong to deposit the sulphur in the water. Where the gas came from it would be difficult to say. Possibly it may have come from the decomposition of the sulphide of iron, so abundant in the mine. It must be recollected that there is often a large quantity of sulphide of iron present, not only in the seams of coal, but also in the floor of the seams. Sulphuretted hydrogen is a most poisonous gas: 1 part in 800 is sufficient to kill a dog.

We now come in our list to air, which occupies a middle position, between the light and heavy gases. Air in its normal condition at the surface will, we know, support combustion; but when we sink down into the earth the air will no longer support combustion; candles begin to flicker when burnt in it, and at last go out. The air is vitiated in many ways—by stagnation, by the respiration of the men, by chemical changes, &c. Oxide of iron is a mineral common in veins, and is always tending to pass into the state of peroxide. Again, syenites and hornblendes absorb large quantities of oxygen. Again, sulphide of iron when present is always tending to decompose and abstract oxygen from the air. In brown coal mines the air becomes foul from the absorption of oxygen by the coal itself, according to Bishoff; and, according to Marchand, from its absorption by the sulphide of iron present. In sinking or in driving we cannot expect to be able to go at all times equal distances without the aid of ventilation, although we may undoubtedly increase the distance by increasing the size of the shaft or level. After this consideration comes that of the nature of the ground through which we have to drive; and it may be here stated, as an undoubted fact, that we can drive further without the aid of ventilation in hard than in soft ground; as, also, that we may drive further in grey than in black ground or shale.

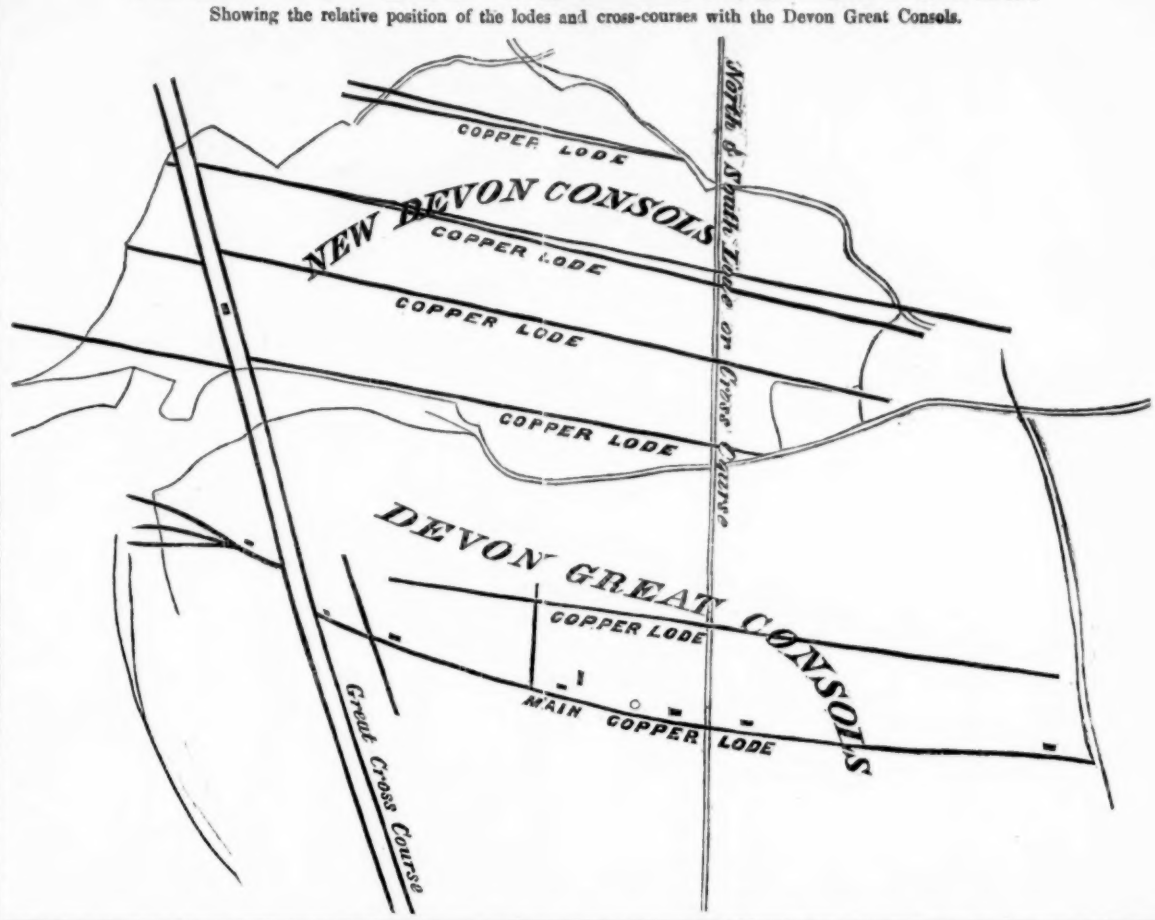
We now come to nitrogen, which is so nearly the same thing as impure air that we need not consider it separately. Another gas found in mines is carbonic oxide, having a specific gravity 0·97; it is an inflammable gas, and very poisonous. In collieries where there are underground fires great care should be taken not to allow this gas to accumulate.

The lightest of all gases found in mines, and the worst enemy of the miner, is fire-damp, or light carburetted hydrogen, with a specific gravity 0·55; this gas is always, therefore, found in the upper chambers of a mine. When pure it burns with a pale blue flame, and is not destructive to life, but when impure it becomes highly inflammable, explosive, and most dangerous to inhale. If this gas forms 1-30th part of the atmosphere it is slightly explosive, when from 1-30th to 1-15th its explosiveness increases immensely, and when from 1-15th to 1-7th it is almost as explosive as gunpowder. Beyond 1-7th it is less explosive, but suffocating; when above that, again, it may be breathed with impunity. If mine workings are fiery it makes a great difference in the danger to the workmen whether they work upwards or downwards; when possible they should always work downwards. In some collieries there are blowers of gas, which suddenly escape from fissures in the coal at a tremendously high pressure, and to supply ventilation for such contingencies is quite impossible; in fact, all we can do is to take every precaution against explosion. An instance of a blower occurred at the Oaks Colliery, near Barnsley, where the men were splendidly drilled to take every precaution in case of such emergencies, by dipping their lamps into the water, &c. All the men were supplied with safety-lamps, some with Stephenson's, others with Davy lamps. The blower burst from the floor of the colliery from several places at the same time like an evolution of steam; the Stephenson lamps were immediately put out, the Davy lamps became red hot, and but for being immersed in water, an explosion would have ensued. The saving of the miners' lives can only be attributed to the excellent discipline they had been accustomed to. Another instance of a blower from a coal seam was that in the Staffordshire Main Colliery, also near Barnsley, and curious from the fact that it came from the Silkstone coal, usually not fiery. Accident was here also avoided by the excellent training of the miners. No amount of ventilation can supply air for such occasions, and all that can be done is to use every precaution, as safety-lamps, &c.

In some collieries where the gas from the blowers flows regularly in a continuous stream, it is collected, and carried in pipes either to the bottom of the mine or to the surface, and there burnt in a jet. In some collieries there have been jets of this sort burning for 20 or 30 years. One great precaution should always be remembered: never allow naked lights in a colliery subject to blowers of gas.

PLAN OF THE NEW DEVON CONSOLS.

Showing the relative position of the lodes and cross-courses with the Devon Great Consols.



THE ALEXANDRA PARK COMPANY.

North London is taking giant strides, socially and commercially. That growing community of feeling between the classes; that modification of antiquated exclusiveness among the upper Ten-thousand; the vulgarising of extreme aristocratic imitativeness among the middling order; and, though last not least, the right-mindedness and unobtrusive self-independence of the "people," which modern education, in all its gradations, has induced, are telling on this wealthy, industrial, and populous district. Civilisation is here doing its spiriting gently but effectively; its main sequence, refinement in taste—the nurse, if not the mother, of invention—is nurturing successfully habits cradled genially in the native sympathies of the masses. Music's influence is acknowledged; floriculture has become the ornamentation of humble cottages—it attracts wherever its rare and beautiful specimens are exhibited. The fact is patent throughout, that *parterre* science is now a favourite and popular study, and the cry is there is no field open to it easily attainable by the million, and where will be found those combinations of entertainments suitable to the classes, without risking those innovations which are termed "mobbing the throng," and yet not circumscribing the enjoyment of any section of sightseers and pleasure-seekers. However, it would seem the Alexandra Park Company have hit upon the best mode of supplying this requirement.

Their proposed arrangements, when completed, cannot well fail to meet spiritedly, liberally, and in a business way, profitable to them, the demand of the public, who, without being fastidious, have become fully alive to the fact that matters might be better ordered in very pretentious quarters; and it is murmured that even the great Crystal Palace itself has not kept its prospectus-promises—this allegation being, for the most part, referable to the quality of the commissariat. But on that score it may be retorted that it is impossible to please everybody, and it certainly is; nevertheless, one cannot shut eyes and ears to the fact of there existing a marked popular distrust in the character of refreshments provided at our public recreative establishments and holiday places of resort. And now comes the question as to what must this bad odour be attributed? There must be some latent cause; people who quit their homes, and go forth with a thorough English feeling to be jolly, are generally wise enough to take things as they go, and tolerate shortcomings not too flagrant, and inferiority not too perceptible to the senses; but when on the most prudent revellers their enjoyments of to-day inflict sensations to-morrow which induce unhappy reminiscences as to the falsification of wines, and the adulteration of liquors imbibed, there is no need to doubt what conclusions are arrived at, and how antagonistic are the opinions disseminated. It is easier to implant a thousand such impressions on the public mind than to eradicate one; and it is, therefore, to the interest of those companies who take upon themselves to cater for the amusement of the multitude to deal, particularly in the instance of provisioning, fairly by them, according to the strict letter of their voluntary bond.

All this the liberal spirit evinced, *ab initio*, by the Alexandra Park Company leads to the assurance all will be well and truly performed; and from their published description of the buildings the following is selected, as a forecast of what is to come:—"The ground-floor, on the south-east side, will be almost entirely devoted to refreshment and dining-rooms, of various sizes and classes, opening by French windows to a verandah overlooking the terrace and sunny slope of the deer-park beyond; and in the basement beneath are such extensive and complete cellar and kitchen arrangements as will insure the desideratum of a first-rate and hot dinner," the charges for which, it is to be presumed, will be on a moderate scale. The park itself contains 480 acres of land, in variation of surface beautifully adapted for pleasure ground, and picturesquely wooded; while the trees being finely matured and well grouped, a pleasing character of antiquity will be given to the prospect, a shading full meet for contemplation and repose, and no less consecrated to guileless sports; at the same time the hint *sylvæ habent aures*, may be here serviceably conveyed to future whispering wanderers in the greenwood in that locality. Even the echoes are sly revealers of secrets of a certain import.

The accessibility of this park, which it is easy to foretel will become in a very few months a deservedly favourite retreat from London smoke, gives it a great advantage. Only a few miles' drive from the metropolis, its proximity to the Wood Green station on the Great Northern line brings it within a fifteen minutes' run of the Victoria station, Farringdon-street, one of ten minutes of the King's Cross station, and what BEAU BRUMMEL called a mere "carriage saunter" of the Regent's Park.

Two hundred acres will be reserved as strickly park-land, the residue of the property being intended for sites of houses, which will be erected in a style of architecture highly ornamental. Of the "Park-building" itself, it is not too much to say that the chromo-lithograph before us, illustrating what it will be in a finished state, foreshadows it as one of the most chaste and imposingly beautiful edifices of modern construction of which London can boast. Our limits preclude us from the bent of following our inclination to give its details *in extenso*. As a whole, it will be, without any exaggeration, a magnificent utility; and when it is considered that music and the drama are to be therein accorded their special spheres, the intellectual conception of the projectors will be appreciated: in point of fact, nothing in this vast design is omitted which can give civilised scope to the mental and physical energies. Nor in the architectural tracing is the locomotive convenience of the public unprovided for; the north-west terrace, 1000 feet long and 160 feet wide, supported by Italian arcades, will be the superstructure of a noble railway station, from which there will be direct access to the building.

The general exterior architectural character of the whole construction will be, as shown by the description put forward, "as much Italian as the nature and dimensions of the old materials *(par parenthese*, those of the late Exhibition) will permit." A cricket ground, with two pavilions in the Swiss style, for the accommodation of the players, will be ready for the lovers of that noble game in the first week of June; and probably somewhat later a spacious gymnasium, on the system of M. TRIAT, of Paris; but the provident tactics of the company in fostering popular amusements stop not here, for in a truly munificent way they intend to give the large sum of 500*l.* prizes, to be contended for at the Great National Archery Meeting of England, which will be held on their cricket ground in July, to be preceded in June by an open-air fancy fair of a novel kind. It will be held near the pavilion, a structure capable of accommodating 10,000 people, and to be used until the completion of the main building, on the top of the hill. For this Fair are now being constructed at Paris 50 boutigues, or shops, in the Swiss style, and there is little doubt they will be pleasingly characteristically and fancifully appropriate to the occasion. In those preparations for the festivities and recreations fine weather inspires, it is pretty evident that if the enterprising and spirited direction which rules the destinies of the Alexandra Park project has taken a leaf out of the books of others, it has recorded its intentions in an improved type, one which is satisfactorily descriptive, and which at the first glance exhibits matter thoroughly understandable, and eminently worthy of public support. There is no occasion to read the stars to augur what will be the success of this association; its sound basis is stamped on a business page, readable by everyone possessed of common sense, and who will take the trouble to reason on plain facts; and while the sagaciously concerted financial scheme will be certain to enhance speculatively the interest of shareholders in the Alexandra Park Company, the site and prestige of the property they have invested in, and the attractions the very able management is securing to it, will place the entire enterprise in the first rank of its class in England.

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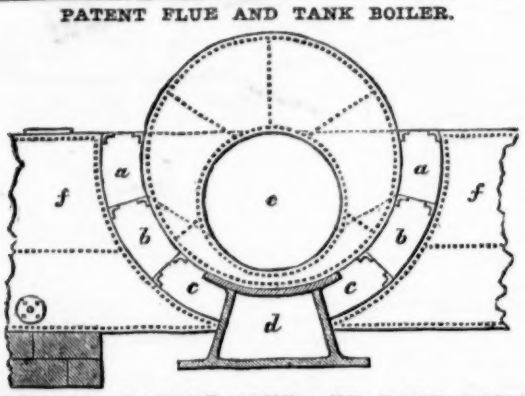
PATENT FLUE AND TANK BOILER.



JEWELL'S PATENT FLUE AND TANK BOILER

A PLAN FOR ECONOMISING THE CONSUMPION OF FUEL IN STEAM BOILERS.

The advantages of this boiler, an illustrated description of which was published in the MINING JOURNAL of October 3, are obvious.

It is provided with WROUGHT IRON FLUES, conveying the fire entirely over the surface of boiler below the water line, and wholly doing away with lime coming in contact with any part of the boiler, lime having been found to destroy the boiler plates before any other parts are the worse for wear. This boiler has four additional flues to the plan at present adopted, thus affording a FAR GREATER AMOUNT of HEATING SURFACE, and MORE EFFECTUALLY CONSUMING the GASES. Between the boilers a wrought-iron tank is fixed, extending the whole length of the boilers, for containing water for feed; this water will pass into the boiler at any temperature required. This boiler will not require anyone to enter the flues for cleansing, as the flues are provided with shifting stoppers at the ends, enabling a person to cleanse the flues even while the boiler is hot; this plan answers for any size or length boiler, and will do away with the cold water feed, which has been the cause of so many accidents. These flues are made of wrought or cast-iron. On the top of the tank a pipe will be placed, to take the waste steam that escapes and carry it to the cistern. The flues for a 6 ft. boiler will be 2 ft. long, and the usual width. It must be remembered that the tank once hot will remain a hot body, with the same amount of heat that passed off before in the brick flues. I would observe that there will be no more water taken from these tanks than will be required for the feed, consequently no more cold water will pass into these tanks than will be necessary for feeding. It is believed this plan will SAVE TEN FEET in the LENGTH of BOILER, and it has been proved to EFFECT a SAVING of rather MORE than ONE-THIRD in the CONSUMPTION of FUEL. These boilers, with flues and tanks, can be supplied on the most reasonable terms.

NOTE.—This plan of Flues and Tank Boiler will be found very beneficial for MARINE ENGINES; the tank would receive the water from the sea, and would not only become hot for feed, but would be the means of preventing in a great measure the salt from passing into the boiler. Where great quantities of hot water are required for other purposes, these tanks will also be found very beneficial. JOHN JEWELL.

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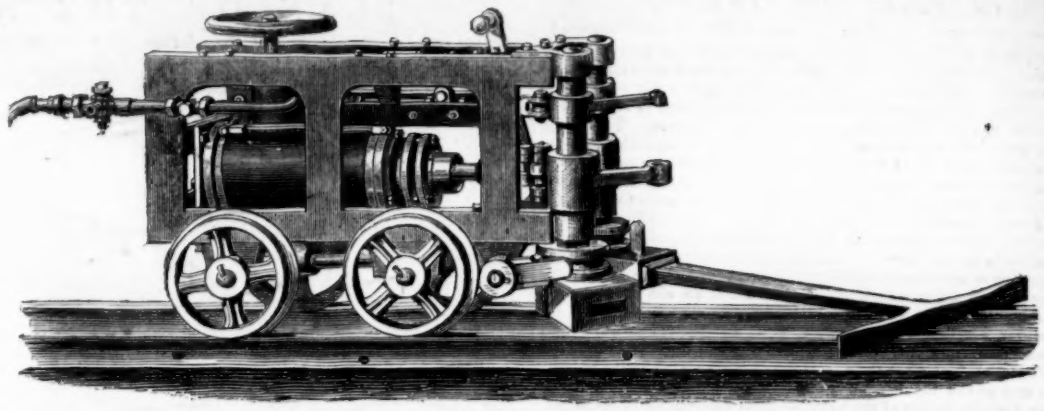

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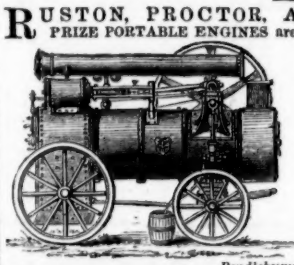

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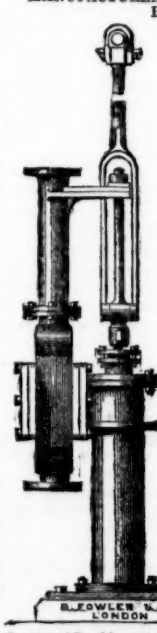

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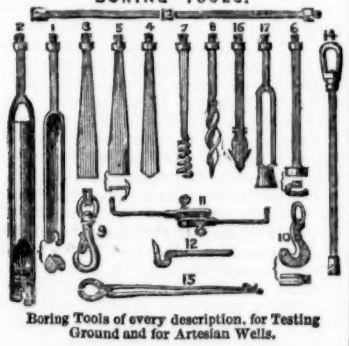

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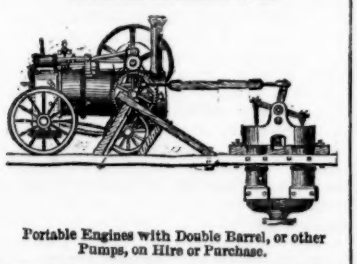

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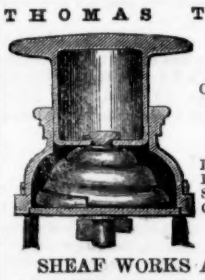

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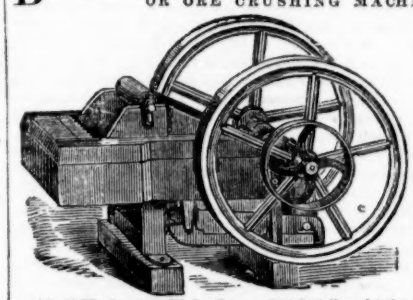

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